WHAT IS CLAIMED IS:

1. A thermal spray coating comprising chromium carbide particles having an average particle size of 5 μm or less, and a matrix metal composed of a Ni-Cr alloy or a Ni-Cr alloy and Ni, which has an average pore diameter of 10 μm or less and a porosity of 8% or less by volume.

2. The thermal spray coating according to claim 1, wherein it has a Vickers hardness of 700 Hv0.1 or more on average, and the standard deviation of said hardness is less than 200 Hv0.1.

3. A thermal spray coating comprising a first phase having chromium carbide particles dispersed in a matrix metal composed of a Ni-Cr alloy or a Ni-Cr alloy and Ni, and a second phase composed of at least one metal selected from the group consisting of Fe, Mo, Ni, Co, Cr and Cu or an alloy containing said metal, said first phase existing more than said second phase.

4. The thermal spray coating according to claim 3, wherein an area ratio of said first phase to a surface portion excluding pores (100%) is 60% to 95%.

5. The thermal spray coating according to claim 3 or 4, wherein said chromium carbide particles have an average particle size of 5 μm or less.

6. The thermal spray coating according to any one of claims 3 to 5, wherein it has an average pore diameter of 10 μm or less and a porosity of 8% or less by volume.

7. The thermal spray coating according to any one of claims 1 to 6, wherein said chromium carbide particles have an average particle size of 3 μm or less.

8. The thermal spray coating according to any one of claims 1 to 7, wherein it has an average pore diameter of 5 μm or less and a porosity of 4% or less by volume.

9. The thermal spray coating according to any one of claims 1 to 8, wherein it has surface roughness (10-point average roughness Rz) of 4 μm or less.

10. The thermal spray coating according to any one of claims 1 to 9, wherein said chromium carbide particles are dendritic and/or non-equiaxial.

11. A piston ring comprising the thermal spray coating recited in any one of claims 1 to 10 at least on an outer peripheral surface.

12. The piston ring according to claim 11, wherein it is combined with a cylinder liner of cast iron having a tensile strength of 300 MPa or less.

13. A method for producing a piston ring comprising a thermal spray coating at least on an outer peripheral surface thereof, said thermal spray coating comprising chromium carbide particles having an average particle size of 5 μm or less and a matrix metal composed of a Ni-Cr alloy or a Ni-Cr alloy and Ni, and having an average pore diameter of 10 μm or less and a porosity of 8% or less by volume; said method comprising thermally spraying a composite powder having said chromium carbide particles dispersed in said matrix metal, at least onto an outer peripheral surface of said piston ring.

14. A method for producing a piston ring comprising a thermal spray coating at least on an outer peripheral surface, said thermal spray coating comprising a first phase having chromium carbide particles dispersed in a matrix metal composed of a Ni-Cr alloy or a Ni-Cr alloy and Ni, and a second phase made of at least one metal selected from the group consisting of Fe, Mo, Ni, Co, Cr and Cu or an alloy containing said metal, said first phase existing more than said second phase; said method comprising thermally spraying a mixed powder of (a) a composite powder having said chromium carbide particles dispersed in said matrix metal, and (b) a metal or alloy powder forming said second phase, at least onto an outer peripheral

surface of said piston ring.

15. The method according to claim 13 or 14, wherein said composite powder is obtained by rapidly solidifying a melt of said matrix metal containing said chromium carbide particles.

16. The method according to claim 13 or 14, wherein said composite powder is obtained by granulating and sintering said chromium carbide particles and said matrix metal particles.

17. The method according to any one of claims 13 to 16, wherein said thermal spraying is conducted by a high-velocity oxygen fuel spraying method or a high-velocity air fuel spraying method.